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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/608,311	06/30/2000	Xiao-Dong Xiang	IB-1506 LBNL	9392
388	7590	09/27/2007	EXAMINER	
FULBRIGHT & JAWORSKI MARKET SQUARE 801 PENNSLYVANIA, N.W. WASHINGTON, DC 200042604			PATEL, PARESH H	
			ART UNIT	PAPER NUMBER
			2829	
			MAIL DATE	DELIVERY MODE
			09/27/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

09/608,311

Applicant(s)

XIANG ET AL.

Examiner

Paresh Patel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08/09/2007.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-68 is/are pending in the application.
- 4a) Of the above claim(s) 1-21,31-42,44-66,68 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 22-28 and 67 is/are rejected.
- 7) ☒ Claim(s) 29,30 and 43 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I, claims 22-30, 43 and 67 in the reply filed on 08/09/2007 are acknowledged. The traversal is on the ground(s) that no changes to the claims represent a shift in invention. This is not found persuasive because they are different inventions for the same reason as stated in the restriction requirement (see restriction requirement dated 07/10/2007 for differences between the inventions).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 22-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacques (US 4364008) in view of Gabriel et al. (Use of time domain spectroscopy for measuring dielectric properties with a coaxial probe, 1986) and Kraszewski et al. (Microwave Resonant Cavities for Sensing Moisture and Mass of Single Seeds and Kernels, 1992).

Regarding claim 22, Jacques discloses a method for measuring electrical impedance of a sample using a microwave cavity probe [coaxial probe 16, see lines 35-

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39 of column 2] having a tip extending [lines 1-11 of column 3] from a microwave cavity, comprising:

positioning said sample [24] outside said microwave cavity [resonant cavity 14, 16] and adjacent said tip [tip of 17, see fig. 1];

causing said tip to emit an evanescent electromagnetic field [microwave from 12];

measuring a resonant frequency shift of said probe [see fig. 5, using 18, 20 and 22, see lines 24-36 of column 4], wherein said resonant frequency shift results from interaction between said sample and said evanescent electromagnetic field [lines 18-36 of column 4]; and

determining said electrical impedance [obvious to moisture contact measurement, see Introduction of Nelson et al for "electrical properties"] and the distance between said tip and said sample [see Distance and Probe response of fig. 6, lines 50-53 of column 4] using the measured resonant frequency shift.

Jacques discloses all the elements. Jacques is silent about determining electrical impedance using the measured resonant frequency shift. Determining electrical impedance of a sample using well-known computer or Impedance Analyzer is common in the art. One such analyzer i.e. HP 4192A impedance analyzer, is used by Grbrial et al. (hereafter Gabrial) for measuring dielectric properties with a coaxial probe using the measured resonant frequency shift [see second paragraph of section 2 and admittance at third paragraph]. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to use well known impedance analyzer

to modify Jacques, in order to measure electrical properties using the measured resonant frequency shift for advantages that impedance analyzer has to offer.

Regarding claim 23, Jacques discloses a method as recited in claim 22, wherein said probe comprises a scanning evanescent microwave probe having said tip extending from a coaxial or transmission line resonator [see 16 with 14 in fig. 1 and lines 35-39 of column 2].

Regarding claim 24, Gabriel discloses a method as recited in claim 22, wherein said measurements of electrical impedance are selected from the group **consisting essentially of** quantitative and qualitative measurements [line 10 of column 5].

Regarding claim 25, Gabriel discloses a method as recited in claim 22, wherein said electrical impedance comprises complex dielectric constant and conductivity of said sample [see complex permittivity with admittance at paragraph 3 of section 2 and Z_0 for equations 1 and 2].

Regarding claim 26, Jacques discloses a method as recited in claim 22, wherein said sample comprises a material selected from the group consisting essentially of dielectric insulators, semiconductors, metallic conductors and superconductors [obvious to lines 45-53 of column 5 and fig. 1. Fig. 1 can be used for known dielectric insulators, semiconductors, metallic conductors and superconductors].

Regarding claim 27, Jacques discloses a method as recited in claim 22, wherein said sample comprises a multi-layered material [multi-layered material is obvious to lines 45-53 of column 5 because of measured electrical property of tissue or organic material etc. using fig. 1].

Regarding claim 28, Jacques discloses a method as recited in claim 27, wherein said sample comprises a material selected from the group ***consisting essentially of*** dielectric insulators, semiconductors, metallic conductors and superconductors [obvious to lines 45-53 of column 5 because of measured electrical property of tissue or organic material etc. using fig. 1. Fig. 1 can be used for known dielectric insulators, semiconductors, metallic conductors and superconductors].

4. Claims 22 and 67 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Misra (US 5233306) and Kraszewski et al. (Microwave Resonant Cavities for Sensing Moisture and Mass of a Single Seeds and Kernels, 1992, pages 555-558).

Regarding claim 22, Misra discloses a method for measuring electrical impedance of a sample using a microwave cavity probe [coaxial probe 108, see lines 31-33 of column 5] having a tip extending [obvious to coaxial probe, see Jacques US 4364008] from a microwave cavity [inherent to coaxial aperture], comprising:

positioning said sample [114 as an example] outside said microwave cavity [inherent to coaxial aperture] and adjacent said tip [tip of 108, see fig. 1 or 2];

causing said tip to emit an evanescent electromagnetic field [microwave from 102];

measuring a resonant frequency shift of said probe [using 106 and 110 for I_1 and I_2 as an example, also see lines 6-11 of column 5 with incident signal with and without the sample], wherein said resonant frequency shift results from interaction between said sample and said evanescent electromagnetic field [lines 18-36 of column 4]; and

determining said electrical impedance [lines 1-7 of column 2 as an example] and the distance between said tip and said sample using the measured resonant frequency shift [see fig. 3 of Misra or Abstract, Introduction and first paragraph of Basic Principles at page 555 of Kraszewski et al.].

Regarding claim 67, Misra discloses a method as recited in claim 22, wherein the measurement is made under quasistatic approximation conditions [see 31-35 of column 4].

Allowable Subject Matter

5. Claims 29-30 and 43 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: No prior art has been found that meets the limitations of claim 22 calling for a method for measuring electrical impedance of a sample using a microwave cavity probe having a tip extending from a microwave cavity, comprising tip-sample interaction is measured with a modulated external field applied to a backing of said sample.


Claims 30 and 43 are allowed because they depend from claim 22.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paresh Patel whose telephone number is 571-272-1968. The examiner can normally be reached on 8:00 to 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ha Nguyen can be reached on 571-272-1678. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

 09/21/07
/Paresh Patel/
Primary Examiner
Art Unit 2829

September 21, 2007